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A. TITLE

**COMBINED SOLAR AND WIND
POWERED ROTOR MECHANISM**

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listed item(s). Transmittal

1 C. KNOWN PRIOR ART

2 There are several known devices that utilize solar generated heat.

1 D. **DISCUSSION OF PRIOR ART AND BACKGROUND OF INVENTION**

2 Energy conversion devices can potentially utilize both solar and wind to drive a
3 rotor mechanism for ultimate energy generated for usage in mechanical, electrical or other
4 form. Devices incorporating features using solar energy indirectly and direct wind power
5 to drive a rotor mechanism would be economical and environmentally harmless,
6 specifically using both wind and solar energy.

7 More directly, means to combine the driving force of both air movement and solar
8 heat so that both such energy sources are utilized directly or indirectly to drive a rotor or
9 similar such mechanism would augment energy output. In this area of energy conversion,
10 there are no effective devices structured to alternately and simultaneously capture solar
11 energy and wind energy as distinct and separate driving forces so as to capitalize on both
12 such energy sources to drive a common separate rotor mechanisms, thereby increasing the
13 energy output productivity of the apparatus. The concept of using, in an apparatus, wind
14 power alone to drive a rotor in the absence of any available sunlight and conversely if no
15 wind is available solar energy can be captured to drive the mechanism.

16 In view of the above, the following objects as set forth below:

17 In summary and in general, the subject invention is based around a base member
18 generally of upright disposition and having a hollow internal chamber with an air inlet
19 opening to admit air into such chamber and an air movement powered base rotor located
20 either in such chamber or outside such chamber, with the rotor blades of such bases rotor
21 being positioned to receive any upward air movements through such chamber so as to
22 rotate such base rotor around its longitudinal central axis.

- 1 More directly, the subject apparatus is generally adapted to have means therein to
- 2 admit outside air into the chamber so that the solar heat generated in the chamber will help
- 3 accelerate through convection means or otherwise to move such air admitted into the
- 4 chamber to facilitate and increase the speed of the admitted air into the chamber and
- 5 thence out of the air outlet opening onto the rotor blades.

1 **E. OBJECTS OF INVENTION**

2 It is an object of the subject invention to provide an improved energy conversion
3 device, using both solar and wind power;

4 Yet another object of the subject invention is to provide improved environmentally
5 sound energy conversion device that is relatively pollution free;

6 Another object of the subject invention is to provide an improved apparatus to
7 capture simultaneously or separately both solar power and wind power for ultimate usage
8 or to capture such diverse power sources on an alternate basis, dependent on existing
9 climatic conditions;

10 Still another object of the subjection invention is to provide a relatively efficient
11 energy source;

12 A further object of the subject invention is to provide an improved device for using
13 solar and wind power sources;

14 It is also an object of the subject invention to provide an improved energy
15 conversion mechanism;

16 Other objects of the subject invention will become apparent from a reading of the
17 description taken in conjunction with the claims.

1 **F. BRIEF DESCRIPTION OF THE DRAWINGS**

2 Figure 1 is a front planar view of the subject invention;

3 Figure 2 is a side elevational view of the subject invention shown in cross sectional
4 configurations;

5 Figure 3 is a perspective view of the subject invention shown partially cut away on
6 the frontal part;

7 Figure 4 is a front elevational view of the subject invention; in section, showing an
8 alternate embodiment of the subject invention.

1 **G. DESCRIPTION OF GENERAL EMBODIMENT**

2 The subject apparatus which incorporates features of the subject invention is a
3 combined wind powered and solar powered rotor mechanism, specifically utilizing energy
4 from both solar and wind sources to provide energy to drive a rotor mechanism, such
5 apparatus comprising in its general form a vertically standing or substantially upright
6 housing structure that has an air intake opening at the bottom portion or at some position
7 intermediate between the bottom portion and upper portion of the apparatus, such opening
8 connecting outside air with a central longitudinally extending chamber in such housing
9 structure that extends upwardly towards the upper part of the apparatus, with a portion of
10 the apparatus being comprised of translucent material to admit sun light into the
11 longitudinal extending chamber with a portion of the chamber being formed of solar
12 absorption materials to receive solar energy from such sun light, with an air driven rotor
13 mechanism at or near the upper portion of the chamber, such rotor mechanism having a
14 central rotational axle rotationally installed through or adjacent to such chamber, such
15 rotational axle having air movement sensitive means to receive the impact of any upwardly
16 extending air moving through such chamber and wherein such rotational axle additionally
17 having air movement sensitive means disposed on a portion of such rotational axle to
18 receive directly air from outside such chamber, for driving such rotational axle.

19 Alternately stated, the subject apparatus which incorporates features of the subject
20 invention is a combined wind powered and solar powered rotor mechanism, specifically
21 utilizing either directly or indirectly energy from both solar and wind sources to provide
22 energy to drive a rotor mechanism, such apparatus comprising in its general form a
23 vertically standing or substantially upright structure that has an air intake opening at the

1 bottom portion or at some position intermediate between the bottom portion and upper
2 portion of the apparatus, such opening connecting outside air with a central longitudinally
3 extending chamber that extends upwardly towards the upper part of the apparatus towards
4 an air opening, with a portion of the apparatus being comprised of translucent material to
5 admit solar energy into the longitudinal extending chamber with a portion of the chamber
6 being formed of solar absorption materials to receive solar energy, with an air powered
7 rotor mechanism at or near the upper portion of the chamber, such rotor mechanism
8 having a central rotational axle rotationally installed at or near the upper portion of such
9 longitudinally extending chamber such rotational axle having air movement sensitive
10 blades inside or outside the upper portion of such longitudinally extending chamber.

11 In summary and in general, the subject invention is based around a base member.
12 generally of upright disposition and having a hollow internal chamber with an air inlet
13 opening to admit air into such chamber and an air movement powered base rotor located
14 either in such chamber or outside such chamber, with the rotor blades of such bases rotor
15 being positioned to receive any upward air movements through such chamber so as to
16 rotate such base rotor around its longitudinal central axis.

17 More directly, the subject apparatus is generally adapted to have means therein to
18 admit outside air into the chamber so that the solar heat generated in the chamber will help
19 accelerate through convection means or otherwise to move such air admitted into the
20 chamber to facilitate and increase the speed of the admitted air into the chamber and
21 thence out of the air outlet opening onto the rotor blades.

1 In one of several alternate structural arrangements of such device, the subject
2 invention may have separate rotor means affixed on an independent or secondary rotor
3 aside from the base rotor or affixed on a different portion of the base rotor. This separate
4 or secondary rotor means is also structured to and positioned to receive wind forces
5 flowing from air outside the chamber against such secondary rotor means. Thus, head-on
6 air currents from the outside drive the secondary rotor or base rotor, while air movements
7 inside the chamber drive the rotor separately thereby producing dual drive forces on the
8 rotor.

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H. **DESCRIPTION OF A SPECIFIC EMBODIMENT OF SUBJECT INVENTION**

4 The following description of one specific embodiment and shall not be construed
5 to limit the scope of the claims annexed hereto, as other embodiments may be considered
6 to be in the scope of the invention herein. Therefore the following description will not be
7 construed by limiting the scope of the claims hereto.

8 The subject apparatus which incorporates features of the subject invention is a
9 combined wind powered and solar powered rotor mechanism, specifically utilizing energy
10 from both solar and wind sources to provide energy to drive a rotor mechanism, such
11 apparatus comprising in its general form a vertically standing or substantially upright
12 housing structure that has an air intake opening at the bottom portion or at some position
13 intermediate between the bottom portion and upper portion of the apparatus, such opening
14 connecting outside air with a central longitudinally extending chamber in such housing
15 structure that extends upwardly towards the upper part of the apparatus, with a portion of
16 the apparatus being comprised of translucent material to admit sun light into the
17 longitudinal extending chamber with a portion of the chamber being formed of solar
18 absorption materials to receive solar energy from such sun light, with an air driven rotor
19 mechanism at or near the upper portion of the chamber, such rotor mechanism having a
20 central rotational axle rotationally installed through or adjacent to such chamber, such
21 rotational axle having air movement sensitive means to receive the impact of any upwardly
22 extending air moving through such chamber and wherein such rotational axle additionally
23 having air movement sensitive means disposed on a portion of such rotational axle to
24 receive directly air from outside such chamber, for driving such rotational axle.

1 Alternately stated, the subject apparatus which incorporates features of the subject
2 invention is a combined wind powered and solar powered rotor mechanism, specifically
3 utilizing either directly or indirectly energy from both solar and wind sources to provide
4 energy to drive a rotor mechanism, such apparatus comprising in its general form a
5 vertically standing or substantially upright structure that has an air intake opening at the
6 bottom portion or at some position intermediate between the bottom portion and upper
7 portion of the apparatus, such opening connecting outside air with a central longitudinally
8 extending chamber that extends upwardly towards the upper part of the apparatus towards
9 an air opening, with a portion of the apparatus being comprised of translucent material to
10 admit solar energy into the longitudinal extending chamber with a portion of the chamber
11 being formed of solar absorption materials to receive solar energy, with an air powered
12 rotor mechanism at or near the upper portion of the chamber, such rotor mechanism
13 having a central rotational axle rotationally installed at or near the upper portion of such
14 longitudinally extending chamber such rotational axle having air movement sensitive
15 blades inside or outside the upper portion of such longitudinally extending chamber.

16 In summary and in general, the subject invention is based around a base member
17 generally of upright disposition and having a hollow internal chamber with an air inlet
18 opening to admit air into such chamber and an air movement powered base rotor located
19 either in such chamber or outside such chamber, with the rotor blades of such bases rotor
20 being positioned to receive any upward air movements through such chamber so as to
21 rotate such base rotor around its longitudinal central axis.

1 More directly, the subject apparatus is generally adapted to have means therein to
2 admit outside air into the chamber so that the solar heat generated in the chamber will help
3 accelerate through convection means or otherwise to move such air admitted into the
4 chamber and thence out of the air outlet opening to facilitate and increase the speed of the
5 admitted air into the chamber onto the rotor blades.

6 In an alternate structural arrangement of such device, the subject invention may
7 have separate rotor means affixed on an independent or secondary rotor aside from the
8 base rotor or affixed on a different portion of the base rotor. This separate or secondary
9 rotor means is also structured to and positioned to receive wind forces flowing from air
10 outside the chamber against such secondary rotor means. Thus, head-on air currents from
11 the outside drive the secondary rotor or base rotor, while air movements inside the
12 chamber drive the rotor separately thereby producing dual drive forces on the rotor.

13 In yet another embodiment of the subject invention, the solar absorption portion in
14 the internal chamber of the device may be interconnected to electrical conversion means to
15 transfer heat energy to electrical energy to supplement the energy output of the device.

16 The subject apparatus which incorporates features of the subject invention is a
17 combined wind powered and solar powered energy conversion mechanism, specifically
18 utilizing energy from both solar and wind sources to provide energy to ultimately drive a
19 rotor mechanism, such apparatus comprising in its general form a vertically standing or
20 substantially upright structure that has an air intake opening at the bottom portion or at
21 some position intermediate between the bottom portion and upper portion of the
22 apparatus, such opening connecting outside air with a central longitudinally extending

1 chamber that extends upwardly towards the upper part of the apparatus, with a portion of
2 the apparatus, in one embodiment, being comprised of translucent material to admit solar
3 energy into the longitudinal extending chamber with a portion of the internal chamber, in
4 one embodiment, being formed of solar absorption materials to receive solar energy, with
5 an air powered rotor mechanism at or near the upper portion of the chamber, such rotor
6 mechanism having a central rotational axle rotationally installed through or adjacent to an
7 air outlet opening on such chamber, such rotational axle having air movement sensitive
8 means to receive the impact of any upwardly extending air through such chamber and
9 additionally having air movement sensitive means disposed on a portion of such rotational
10 axle to help drive such rotor upon receiving head-on air movement from outside such
11 chamber.

12 The subject apparatus which incorporates features of the subject invention is a
13 combined wind powered and solar powered rotor mechanism, specifically utilizing energy
14 from both solar and wind sources to provide energy to drive a rotor mechanism, such
15 apparatus comprising in its general form a vertically standing or substantially upright
16 structure that has an air intake opening at the bottom portion or at some position
17 intermediate between the bottom portion and upper portion of the apparatus, such opening
18 connecting outside air with a central longitudinally extending chamber that extends
19 upwardly towards the upper part of the apparatus, with a portion of the apparatus being
20 comprised of translucent material to admit solar energy into the longitudinal extending
21 chamber with a portion of the chamber being formed of solar absorption materials to
22 receive solar energy, with an air powered movement rotor mechanism at or near the

1 upper portion of the chamber and preferably near the outlet opening of such chamber,
2 such rotor mechanism having a central rotational axle rotably installed at or near the upper
3 portion of such longitudinally extending chamber adapted to receive solar heated air
4 flowing upwardly and outwardly from said chamber, such rotatable axle having air
5 movement sensitive blades fully inside partially inside or completely or partially outside the
6 upper portion of such longitudinally extending chamber, or which may be disposed in any
7 other appropriate manner to receive the impact of such air flowing out of the chamber.

8 In summary and in general, the subject invention is based around a base member
9 generally of upright disposition having a hollow internal chamber with an air inlet opening
10 to admit air into such chamber and an air movement powered base rotor located either in
11 such chamber or outside such chamber, with the rotor blades of such rotor being
12 positioned to receive any upward air movements through such chamber through such air
13 outlet opening so as to rotate such base rotor along its longitudinal central axis.

14 More directly, the subject apparatus is generally adapted to have means therein to
15 admit outside air into the chamber so that the solar heat generated in the chamber will help
16 accelerate, through convection means or otherwise, and move upwardly such air admitted
17 into the chamber to facilitate and increase the speed of the admitted air into the chamber
18 onto the rotor blades.

19 In one of several alternate structural arrangement of such device, the subject
20 invention may have separate rotor means affixed on an independent or secondary rotor
21 aside from the base rotor or affixed on a different portion of the base rotor. This separate
22 or secondary rotor means is structured to and positioned to receive wind forces flowing

1 from air outside the chamber against such secondary rotor means. Thus, air currents from
2 the outside drive the base rotor or a separate rotor, while air movements emanating from
3 inside the chamber drive the rotor separately or another rotor thereby producing a
4 separate drive force on the rotor.

5 In the specific embodiment described herein, the rotor blades or rotor drive means
6 on the base rotor are situated to receive moving air up through such chamber and may be
7 positioned in such a manner so that such rotor blade means may also be concurrently
8 driven in a rotational manner by ambient air flow impinging directly head-on additional
9 rotor means from air outside the chamber flowing generally head-on against such rotor.

10 For a description of one specific embodiment of the subject invention, among
11 several, attention is directed to the drawings in which a solar-wind energy conversion base
12 structure 10 is shown. Energy conversion base structure 10 is preferably, but not
13 essentially, an upright structure comprising a housing 20 that has a lower end 30 and an
14 upper end 40. The housing 20 contains inside such housing proper an internal
15 longitudinally extending spatial hollow chamber 50 that in the specific embodiment is
16 vertically disposed and is preferably but not essentially aligned along the longitudinal
17 vertically extending central axis of the housing 20.

18 In such embodiment, it is not critical that the hollow chamber 50 be longitudinally
19 extending or vertically extending or be in any symmetrical form or that the chamber 50 be
20 aligned with the vertical longitudinal central axis of the housing as that the housing itself
21 be aligned vertically or upright. Housing 20 has a front surface 60 and a back surface 70,
22 and lateral sides 80A and 80B and a lower surface 85A and an upper surface 85B. At or

1 near the lower portion of the front surface 60 is an air intake opening 90 which is adapted
2 to draw in air currents from areas outside housing 20 arriving at or near the lower end 30
3 of the housing 20. It is to be stated that the air intake opening 90 can be located at any
4 position on the housing 20 and not necessarily near or adjacent to the bottom thereof. It is
5 preferable that the front surface 60 of housing between lucent to permit sunlight to
6 penetrate directly into housing 50 for solar heating purposes.

7 It is stressed that the base structure 10 formed essentially as a housing, as set forth
8 above, may be structured otherwise than as set forth in the above described preferred
9 embodiments. More directly, the base structure 10 need not be constructed as a
10 longitudinally extending member, nor need it be rectangular or parallelepiped in shape as
11 seen from the front or in other positional views. Moreover, the base structure 10 need not
12 be vertically upright as portrayed and it is not essential or critical that the air intake
13 opening 90 be at lower end of the housing 20. The housing may be any configuration
14 from any viewpoint and the internal hollow chamber in to the housing 20 need not be
15 structured in the form shown and described.

16 In the specific embodiment set forth above, the hollow chamber 50 is substantially
17 enclosed except for an air intake opening 90 at or near the lower end 30 of the housing 20,
18 which air intake opening 90 is open to and otherwise preferably, but not essentially, faces
19 forward from the frontal surface 60 optimally facing towards the prevailing windflow
20 patterns, as particularly seen in figure 2. Moreover, it is preferable that the front surface
21 60 of the base structure 10 be positioned to face a direction to receive sun light during a
22 portion of the day, as more fully described and comprehended below. Moreover, in some

1 circumstances it may be optimal to position the base structure 10 in a substantially upright
2 position along the side of a mountain, hill or cliff 108 as graphically represented in figure
3 2. The reason for such position is to take advantage of the usual upward flow of winds or
4 air currents up the side of a mountain during day time hours.

5 Thus, from the above description and as can be seen from the drawings, the
6 internal hollow chamber 50 is structured and formed by the front surface 60, the rear
7 surface 70 and the sides 80A and 80B, enclosed upper surface 85B and lower surface 85A
8 and 105B of housing 20 respectively, and is exposed to outside air through air inlet
9 opening 90, as seen, which air inlet opening is adapted to feed air into the lower part of
10 the hollow chamber 50, as shown schematically in figures 1 and 2.

11 For the purpose of implementing the preferred embodiment, the front surface 60 of
12 housing 20 should optimally be comprised of a translucent material in order to permit solar
13 rays to pass through such front surface into the hollow chamber 50 for solar heating of the
14 air inside the chamber 50. For purposes of facilitating the solar heating of the incoming
15 ambient air inside the hollow chamber 50, it is preferable, but not critical, to have the
16 frontal surface area 110 of the rear portion 70 of the housing 20, comprised painted or
17 coated with a solar absorption material such as black paint. This solar heat absorption will
18 function to retain heat and help generate more heat as it absorbs sunlight to the ambient air
19 as it rises upwardly in the hollow chamber 50, thus providing a greater velocity to the
20 upward flow of air.

21 In constructing the specific embodiment, the hollow chamber 50 in housing 20 may
22 be, but not necessarily gradually tapered to a smaller perimeter or spatial size as it extends

1 upwardly from the air intake opening 90 to the upper portion of the chamber 50, as can be
2 seen in the drawings. This tapering effect also helps to channel moving air upwards into a
3 gradually restricted area to move such rising air with greater velocity. At or near the
4 upper end of the housing 30 is the air outlet opening 115, which latter opening is
5 structured to emit the rising air from the upper part of the enclosed chamber 50, as
6 demonstrated schematically in figures 1 and 2. The air outlet opening 115 can be
7 positioned at any portion of the housing 20, however.

8 Affixed and supported above housing member 20 is a rotor shaft member 150 that
9 preferably projects directly and frontally towards the front surface portion 60 of the
10 housing, and thus, specifically extends frontwardly generally perpendicularly to the front
11 surface portion 60 of the housing and facing preferably towards the area of any prevailing
12 winds. The rotor shaft member 150 can be mounted through a bearing surface element
13 160 so that when the rotor shaft rotates, it will rotate about such fixed bearing surface.
14 Bearing element 160 can be affixed to the housing or on other nearby structures. The
15 rotor shaft 150 can be thence interconnected to a generator 165 powered by the rotational
16 movement of rotor 160.

17 In the specific described embodiment herein the rotor shaft 150 is mounted above
18 the housing 20 so that there is sufficient open space for the direct oncoming wind at the
19 upper level of housing 30 to effectively drive the rotor without encountering eddy current
20 effects interfering with such air flow. However, in some embodiment the rotor shaft 160
21 can be mounted within the housing 20, as seen in figure 4, or above or in front of such
22 housing or in other positions. In any structural circumstances, the front portion of the

1 rotor member 150 may be face frontally, as stated with the frontal portion of the rotor
2 member 150 preferably extending outward away from the housing or beyond the front
3 surface 60 of the housing 20 and preferably has multiple turbine blades 170A, 170B, 170C
4 and 170D for receiving the impact of winds in the air outside housing 20 to drive the rotor
5 150 independently of any air movement forces generated within housing 20. However, the
6 number of turbine blades deployed on the rotor member 150 is optional.

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1 The radially inner portions 175A, 175B, 175C and 175D respectively of rotor
2 blades 170A, 170B, 170C and 170D are affixed in a radially-spaced manner on the outer
3 surface of the rotor shaft to create a symmetrical arrangement of spacing of such rotor
4 blades. This latter aspect is not critical to implementation of the subject invention Thus,
5 as seen in figures 1, 2 and 3 of the drawings, the rotor shaft 150 is mounted just above the
6 upper portion of housing 20, inside or outside of the hollow chamber 50 at an area where
7 the housing portion is more narrow when viewed in a frontal view. Moreover, as the
8 rotor shaft 150 preferably extends above and outwardly from the housing 20, it is essential
9 that the rotor blades clear the housing for free rotational movement.

10 As seen in the frontal elevational view as shown in figure 1, the housing 20 with it
11 longitudinally extending hollow chamber 50 with the lower end 85B and upper end 85A
12 thereof disposed or otherwise positioned in a substantially vertically upright position the
13 lower end 180 of the chamber 50 is generally the area where the air intake opening 90 is
14 located. In structure, the described arrangement as seen in figure 3 is a hollow chamber
15 50 preferably and ideally, but not essentially, will extend over almost the full width of the
16 lower end 85B of the housing 20. By this latter arrangement the air intake opening 90
17 should extend over the entire width of the lower end 180 of the chamber 50 as it leads into
18 and fully communicates spatially with the lower end of the chamber 50. In other words,
19 the spatial area of the chamber 50 at the lower end 180 thereof should ideally, but not
20 substantially, be substantially equal to the width of the air intake opening 90 at the area
21 where such air inlet opening extends into the hollow chamber 50. This will enable the

- 1 lower end 180 of hollow chamber 50 to receive the full impact of the air flow into and
- 2 from the air inlet opening 90 without hindrance.

3 As further can be observed from a view of the drawings, particularly figures 1 and
4 2, hollow chamber 50 is preferably structured to be progressively narrowed as it extends
5 upwardly to the upper end 85A of the housing member 20. More specifically, in the
6 upright position for housing 20, the chamber 50 is preferably gradually tapered, both
7 laterally and in front-to-back depth, to a more narrowed restricted spatial area as it
8 extends upwardly to the upper end 85A of the housing 20, which upper end 85A should
9 preferably, but not necessarily, be the uppermost part of the chamber 50 when the housing
10 20 is in the upright position discussed above. This progressive narrowing of the inner
11 hollow chamber 50 is not critical, however, it is preferable to help funnel the upwardly
12 flow of air to increase both the velocity and volume of the upward air flow towards air
13 outlet opening 115. In this latter aspect it is preferable that this progressive narrowing of
14 the chamber 50 be directed towards the upper air outlet opening 115, as seen in figure 1, 2
15 and 3 so that all the rising flow of air will be directed to vent through such upper outlet
16 115 opening to the outside and flow directly against rotor 150. The purpose of this aspect
17 is to increase the speed of the rising air flow and direct all such resultant air flow from air
18 outlet opening 115 onto a limited part of the rotor mechanism. Since the rotor member
19 150 is mounted on a shaft that is preferably, but not essentially perpendicular to the back
20 wall portion 70 of housing 20 and thus such resultant air flow is directed substantially
21 perpendicular to the longitudinal axis of the rotor mechanism 150, as schematically shown
22 in the drawings.

1 In the one embodiment of the subject invention, the air outlet opening 115 is
2 positioned to direct all resultant air flow from chamber 50 onto the rotor blades 170A,
3 170B, 170C and 170D towards the bottom of such rotor blades and not frontally.
4 However, because of the aerodynamic structures and positioning of the rotor blades 170A,
5 170B, 170C and 170D, the air flow impact from the outlet opening will propel the rotor
6 blades only minimally. It is therefore preferable to direct the flow of the air upwardly onto
7 a separate portion of the rotor 150 away from the rotor blades 170A, 170B, 170C and
8 170D. For this purpose, the rotor 150 can be equipped and structured with one or more
9 flat, paddle-wheel like rotor blades preferably that are structured to receive efficiently the
10 air upward flow of air as in a turbine arrangement of a paddle-wheel arrangement. For
11 this purpose, air turbine blades 210A, 210B, 210C and 210D, 210E all affixed on their
12 radically inner ends to the rotor member 150 are shown as flat blade members to receive
13 the impact of air over such blades in a paddle-wheel arrangement to impel against the
14 blades and rotate the rotor 150 in either a clockwise or counterclockwise manner, all
15 independently of any movement of the rotor generated from the thrust of air directly over
16 blades 170A, 170B, 170C, and 170D. For efficiency in this regard, it is preferable to
17 position the air outlet opening 115 so that the upward thrust of air from such opening is
18 projected over only one side of the rotor, so as to impinge only on the turbine blades
19 210A, 210B, 210C and 210D disposed either to the left or right of the central axis of rotor
20 150, as seen in figure 1. By this positioning the rotor 150 will be forced to rotate
21 clockwise or counterclockwise depending on which side of the rotor the air outlet opening

1 is positioned. This aspect should be consistent the direction of rotation of rotor 150
2 generated by rotor blades 170A, 170B, 170C and 170D.

3 As further seen from the frontal view in figure 4 in such embodiment, the wall 300
4 within chamber 50 is curved as it extends from its bottom end 305 toward the upper end
5 310 of the housing 20, however it can be straight as observed from such view. More
6 particularly the wall 300 is directed towards the left side wall 80A of the housing 20, but
7 within the internal spatial area 50 of the housing and in the embodiment shown in the
8 drawings the upper end 310 of the internal wall 300 is abruptly terminated first beneath the
9 position of the rotor member 350 as seen in the drawings of the rotor. The most narrow
10 part of the chamber 50 is at that portion of the housing 20 just immediately adjacent or
11 beneath the position of the left side of the rotor mechanism 350, as seen from the vantage
12 point of figure 4. As stated, at this point the internal chamber 50 terminates into an air
13 flow passage 360 that ejects the air flowing up through the chamber 50 from the air intake
14 90 into the spatial area where the rotor member is located. As seen the air outlet opening
15 360 is positioned so that the emitted upward air flow is directed towards only one side of
16 the rotor mechanism 350. Alternatively stated in this embodiment of the subject invention
17 the air ejected from the chamber 50 through the air flow passage 360 is directed by the
18 existence of the narrowed portion to flow over the left portion only of the rotor member
19 350. By this latter arrangement air flowing out of the chamber 50 will impinge against the
20 rotor blades of rotor member 350 in position on the left side of the rotor to move the
21 blades clockwise, and will maintain this so impinging effect with continued flow against
22 the rotor blades then dynamically positioned on the left side of the rotor and thence in

1 succession against the next set of blades that move clockwise into position on the left side
2 of the rotor. This restricted air flow pattern will keep air from impinging against the rotor
3 blades on the right side of the rotor so as to prevent a net effect of the air flow pushing
4 upward on all the positioned rotor blades on the right side and left side of the rotor 360
5 which could interfere with the clockwise movement of the rotor-as air impinging on the
6 blades dynamically positioned on the right side of the rotor would cause the rotor to move
7 counterclockwise. This latter effect is important as the front rotor blades, like those on
8 rotor 150 in the first described embodiment project out beyond the housing 20 into the
9 open air to receive outside air directed against the rotor. The front of rotor 350 projects
10 outwardly from the front of the housing to receive also the direct impact of the wind. An
11 alternate arrangement the rotor could be position it parallel to the back wall portion of the
12 housing to face the blades head on relative to the upward flow of air.

13 Once the air flow impinges against the rotor blades it is ejected through an outlet
14 opening 360 on housing 20 or the resultant spent air may be directed downwardly through
15 the spatial area 400 in housing 20 that is formed to the right in chamber 50 and to the left
16 of the wall 300 is placed in the housing. As seen this remaining spatial area 400 to the
17 right of the chamber 50 can lead back to the area just adjacent into the air inlet opening
18 90. To recirculate the air through chamber 50, a vacuum pump may be used to help this
19 process, not shown.

20 In all embodiments therein the rotor member inside the housing is structured to be
21 rotatable, as driven by the rising air inside the chamber, as more specifically discussed
22 above, with the central concept being that air that is drawn up through the chamber 50, it

1 will be heated by solar heat energy passing through the translucent front wall 60 which
2 solar energy will heat the air rising through the chamber 50 such solar heating being
3 enhanced by the dark surface or the posterior wall 70 of the housing 20. More specifically
4 as the air is heated it rises through the chamber 50 it will become heated and rise at a
5 more forcible rate and greater velocity so that the resultant air flow will have a greater
6 impact against the blades and rotors on the rotor member 160 or rotor member 350. As
7 stated above, in order to facilitate and otherwise accelerate the upward flow of air in the
8 chamber 50, the chamber is structured to be increasingly narrowed and constricted so that
9 the rising air as it is heated in the chamber will be heated by solar rays entering the
10 chamber through the front translucent surface 60. Thus, as the air is heated, by solar
11 energy, it will rise at yet a more increasingly faster rate in restricted space in its upwardly
12 movement.

13 As stated in one embodiment, only the back surface 70 of the chamber 50 is coated
14 with a dark material so that the solar absorption process is enhanced only in the chamber
15 50 portion. Moreover, in another embodiment, the back surface of the chamber 50 which
16 is solar absorptive may be equipped with suitable solar cells or other means to convert the
17 impacted heat thereon to electrical energy to supplement the power generated by the air
18 driven rotor.

19 As can be further seen in alternative embodiments, the rotor member 150 or 350
20 can be affixed in the housing member 20 is thus exposed in part to the frontal flow of wind
21 in addition to the upper flow of wind from inside the chamber 50. The rotor shaft will
22 thus be driven by two air flow force components. First, the oncoming head wind will drive

1 the rotor, as in the case of an ordinary windmill, and airflow in chamber 50 will also
2 impinge the rotor blades on one side as discussed above. This will provide two separate
3 air movement components for the rotor movement.

4 In implementing this invention it is important to focus on the effect of heated air to
5 rise upwardly particularly on the sides of mountains and large solid structures. This
6 combined solar wind effect on mountain sides during day time hours can be capitalized
7 using in the subject invention. For instance, if the subject apparatus 10, with attendant
8 housing 20 were placed upright along the side of a mountain the normal upwind air flow
9 from the base of the mountain can be directed into the air through the air inlet opening 90
10 of the apparatus 10 to flow upwardly through chamber 50 to impel the rotor. In such
11 situation, the rotor can also be exposed to the frontal wind as stated above. On the other
12 hand, the rotor may be covered and not exposed at all to outside air, as suggested in part
13 by figure 3. If such a device is placed along said mountain or structure it would need to
14 be significantly high, or long enough to capture as much solar energy as possible in the
15 upper rise of the air in Chamber 50. For this purpose a heights of 100 feet or more would
16 be optimal but lesser or greater heights could be used. However, it is not critical to the
17 subject invention to place the device near a mountain nor is it necessary to structure it to a
18 substantial height, as it can be of any length or height.

19 In summary, the subject invention is a structure for harnessing sun generated air
20 currents to drive a rotor mechanism comprising:

21 (a) a housing member having a frontal surface and a rear surface, such housing
22 member having an internal chamber within such housing member, with such housing

1 member having a translucent cover on such frontal surface, to admit sunlight into such
2 chamber, and wherein such housing member has an air inlet opening and an air outlet
3 opening, such inlet opening and such air outlet opening extending between such internal
4 chamber and outside such housing, rotor means affixed adjacent to such air outlet opening
5 to receive the air flow from such air outlet opening for driving such rotor.

6 Another summary is that the subject invention is a structure for harnessing air
7 currents to drive a rotor mechanism comprising:

8 (a) a housing member having an outer surface, such housing member having an
9 internal chamber with such housing member having a frontal wall comprising the enclosure
10 to such chamber, with such frontal wall having a portion thereof which is translucent for
11 admission of sunlight into such chamber, such housing member having an air inlet opening
12 leading from spatial areas outside such housing member to spatial areas inside said
13 chamber of such housing member;

14 (b) air outlet means on such housing member, such air outlet means extending
15 from areas inside such chamber to spatial areas outside such chamber;

16 (c) air-driven rotor member having a central rotatable axle affixed to a position
17 adjacent such air outlet means, such rotor-driven member having a rotor blade affixed to a
18 portion of such rotatable axle for receiving incoming wind and wherein such rotor means
19 has additional rotor blades to receive the impact of air escaping from such chamber in such
20 housing.

21 Furthermore, the subject invention can be summarized as a combined solar
22 powered and wind powered rotor mechanism comprising

1 (a) a housing member, such housing member having an internal longitudinally
2 extending chamber, disposed with side such housing member, and wherein such housing
3 member has an air inlet opening therein which extends from spatial areas outside such
4 housing into such chamber, and wherein such housing has an air outlet opening to vent aid
5 from such chamber;

6 (b) a rotor mechanism having a plurality of vane members to receive the
7 impact of air vented from such air outlet opening and drive said rotor mechanism.

8 In further summary, the subject invention is a rotor apparatus structured to be
9 driven by wind force and solar energy comprising:

10 (a) a housing member with an internal chamber with an upper portion and a
11 lower portion, said housing member having a translucent front surface portion on the
12 outside of solar chamber and a solar absorptive back surface portion with a solar energy
13 collector chamber within such housing, with such chamber being disposed between such
14 front surface portion and such back surface portion, such housing member having an air
15 intake opening on the lower portion of such housing, which air intake opening leads to the
16 solar energy collection chamber, such housing having an air outlet opening that emits
17 passing air from the solar energy collection chamber, and further comprising;

18 (b) rotatable shaft means rotatably mounted through such housing member
19 with a portion of such shaft projecting out from the front of such housing and a portion of
20 such shaft passing through the solar absorption chamber, and further comprising;

21 (c) wind driven rotor means disposed concentricity on that portion of the
22 rotatable shaft that projects frontally of the front surface, and further comprising;

- 1 (d) air driven means disposed on that portion of the rotor shaft in the chamber.